

## **2.0 DESCRIPTIVE STATISTICS**

As noted in the previous chapter, nine regular types of samples were collected at each housing unit in this study (see Table 1-3). Vacuum dust samples were collected from air ducts, interior and exterior entryways, floors, window stools, and window channels within each house. Soil core samples were obtained at the boundary of the property, the foundation of the house, and an entryway to the house. In addition to these nine sample types, wipe dust samples were also collected from floors for purposes of comparison with vacuum sampling results. In the analyses that follow, abbreviations are used to identify these various sample types. The abbreviations were displayed above in Table 1-4.

### **2.1 DUST COLLECTED**

When interpreting results of vacuum dust sampling in a residential setting, information about the amount of dust collected is important. Lead concentrations can not be calculated without measurements of the amount of dust collected. Lead loadings are jointly determined by the lead concentration and the dust loading. And, the detection limit for dust lead concentration is a direct function of the amount of dust collected. In Table 2-1, descriptive statistics are reported by sample type for the amount of dust collected (mg) by the vacuum sampling method. The statistics presented are the number of samples, geometric mean, logarithmic standard deviation, minimum, and maximum. The amount of dust by sample type is illustrated graphically in Figure 2-1. In this figure, box and whisker plots display on a logarithmic scale the amount of dust collected by sample type. Note that the axis' minor tick marks are not uniformly distributed between the major tick marks.

**Table 2-1. Descriptive Statistics for Amount of Dust Collected (mg) and Area Sampled (ft<sup>2</sup>) by Sample Type**

Statistic	Air Duct (Vacuum) [ARD]	Window Channel (Vacuum) [WCH]	Window Stool (Vacuum) [WST]	Floor (Wipe) [FLW]	Floor (Vacuum) [FLR]	Entryway Interior (Vacuum) [EWI]	Entryway Exterior (Vacuum) [EWO]
<u>Amount of Dust (mg)</u>							
Number of Samples	109	98	113	0	238	100	97
Arithmetic Mean	355.42	1324.36	174.11	.	572.12	2880.35	3081.30
Geometric Mean	95.49	617.08	89.22	.	180.81	1112.18	1583.29
Standard Deviation	1.68	1.43	1.18	.	1.65	1.66	1.30
Minimum	2.20	0.50	2.30	.	40.60	8.50	40.60
Maximum	4215.10	13285.80	2299.40	.	14426.00	20857.40	22170.30
<u>Area Sampled (ft<sup>2</sup>)</u>							
Number of Samples	109	98	113	67	238	100	97
Arithmetic Mean	0.43	0.52	0.90	1.00	1.00	1.00	0.98
Standard Deviation	0.26	0.41	0.63	0.01	0.03	0.03	0.07
Minimum	0.03	0.05	0.11	0.96	0.96	0.67	0.50
Maximum	1.44	1.83	4.73	1.00	1.40	1.00	1.00

Box and whisker plots illustrate the center, scatter, and skewness of a dataset. The lower and upper quartiles of the data are represented by the bottom and top of the box, respectively. The distance embodied by the box is termed the interquartile range, the range from the 25th to 75th percentile. The bar within the box portrays the median of the data. The lower and upper tails of the distribution are represented by the whiskers extending from the bottom and top of the box. Extreme data points are classified as either minor (pluses) or extreme (stars) outliers based on their distance from the quartiles relative to the interquartile range. The arithmetic mean amount of dust is displayed as a diamond.

The amount of dust collected by the vacuum sampler was seldom less than 10 mg (the amount targeted by the laboratory chemists in the study plans), and never exceeded 25 grams (25000 mg). The geometric mean amount of dust for each sample type was

at least 90 mg. Problems in collecting air duct samples resulted in their surprisingly small amount of dust. The large amount of dust collected from window channels was due to a very high dust

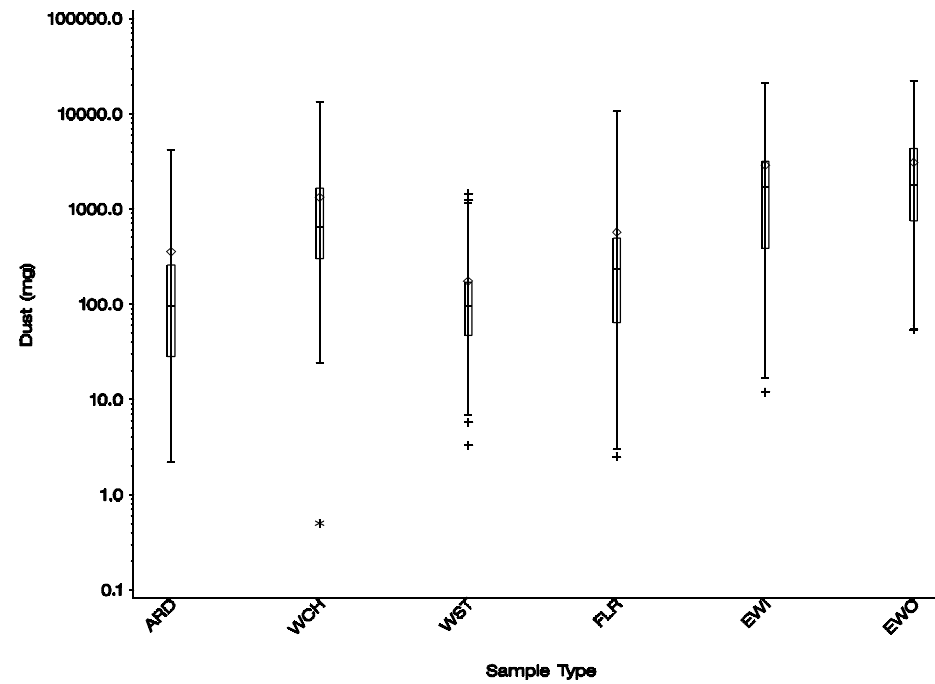


Figure 2-1. Amount of dust collected (mg) by sample type.

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Box represents range from 25th to 75th percentile; bar and diamond represent geometric and arithmetic means, respectively; whiskers represent lower and upper tails of the distribution; and extreme data points are classified as either minor (pluses) or extreme (stars).

loading (mg/ft<sup>2</sup>) which compensated for the very small area available for sampling (less than for window stool samples).

## **2.2 AREA SAMPLED**

The square footage sampled when collecting vacuum and wipe dust samples is useful for interpreting the resulting lead loadings and concentrations. In Table 2-1, descriptive statistics are reported by sample type for the area sampled (ft<sup>2</sup>) by both the vacuum and wipe sampling methods. The number of samples, arithmetic mean, standard deviation, minimum and maximum are reported. These results are illustrated in Figure 2-2 by box and whisker plots of area sampled for each sample type.

50 With only a few exceptions, one square foot of surface area was sampled when the interior entryway, exterior entryway, floor vacuum, and floor wipe samples were collected. The area sampled during the collection of air duct, window stool and window channel samples, however, varied considerably. In the case of window stools, as little as 0.1 ft<sup>2</sup> to nearly 5 ft<sup>2</sup> were sampled. Since the sampling protocol called for collecting dust from the entire window stool or channel, the variation was mostly a function of differences in the construction of the houses. For example, a window stool in house 44 was 47 inches long and 14.5 inches wide, while a window stool in house 95 was 63.5 inches long and 7.9 inches wide. The average area sampled on air ducts and window channels was approximately 0.4 ft<sup>2</sup> while an average of approximately 0.9 ft<sup>2</sup> was sampled on window stools.

## **2.3 LEAD LOADING, LEAD CONCENTRATION, AND DUST LOADING**

Three measurements were made on the dust and soil samples. They are:

Lead Loading: Amount of lead ( $\mu\text{g}$ ) in household dust per square foot ( $\text{ft}^2$ ) of surface area sampled.

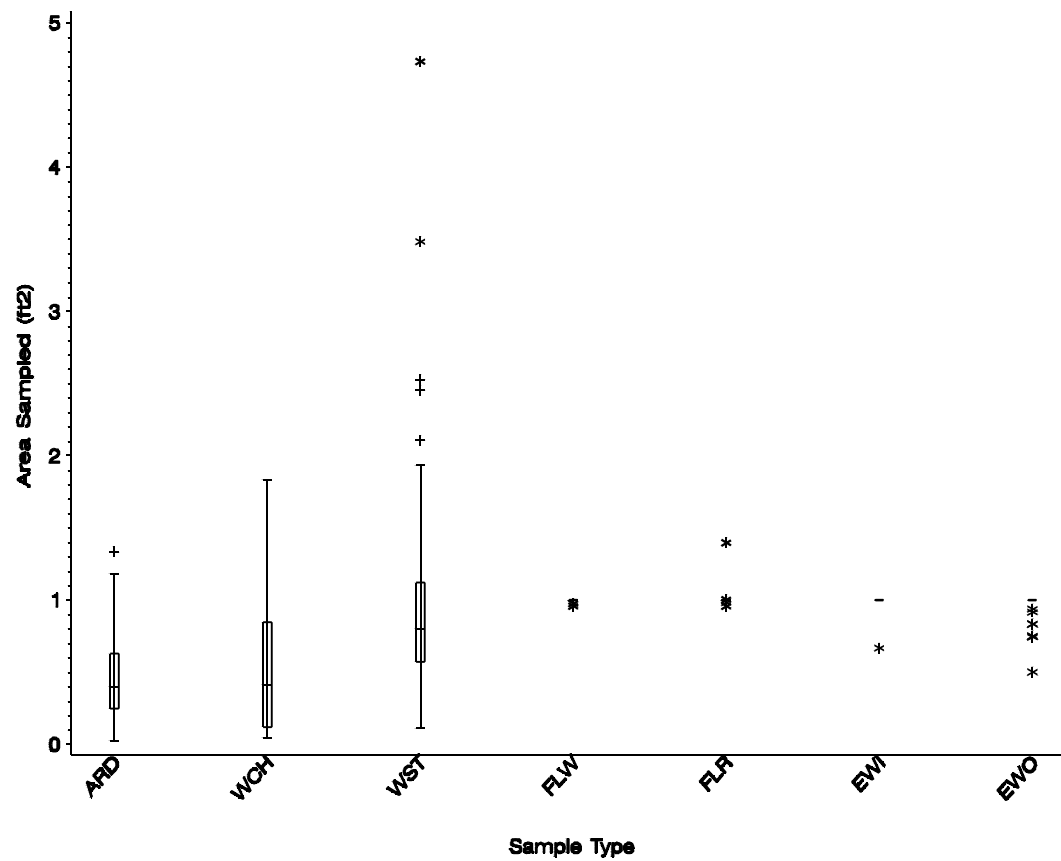


Figure 2-2. Area sampled (ft<sup>2</sup>) by sample type.

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Box represents range from 25th to 75th percentile; bar and diamond represent geometric and arithmetic means, respectively; whiskers represent lower and upper tails of the distribution; and extreme data points are classified as either minor (pluses) or extreme (stars).

Lead Concentration: Amount of lead ( $\mu\text{g}$ ) per gram (g) of household dust sampled, or amount of lead ( $\mu\text{g}$ ) per gram (g) of soil sampled.

Dust Loading: Amount of household dust (mg) per square foot ( $\text{ft}^2$ ) of surface area sampled.

All three measures were obtained for vacuum dust samples. Only lead loading could be measured on wipe dust samples since the amount of dust collected could not be determined due to uncertainty in the weight of individual baby wipes. For soil samples, only lead concentration could be determined because essentially a point, not a surface, was sampled.

Descriptive statistics for all housing units combined were presented above in Table 1-7 by sample type for all three measurement types. The descriptive statistics reported include the number of samples collected, geometric mean, arithmetic mean, logarithmic standard deviation, minimum and maximum. Figure 2-3 displays box and whisker plots for lead loading across all houses plotted versus sample type. Comparable plots for lead concentration and dust loading are presented in Figures 2-4 and 2-5, respectively.

Log-transformed lead loadings, lead concentrations, and dust loadings were used in all of the statistical analyses. Using log-transformed environmental lead measures is common and supported in the literature. Reeves, et al, (Reeves, et al, 1982) found that the normal distribution did not adequately fit their data on lead in paint, soil, and house dust. Further, the data were found to be closer in form to the lognormal distribution than the normal distribution. The data obtained in this CAP Study illustrate another important reason for using log-transformed data; the measurements range over four to five orders of magnitude. In addition, the geometric means are often much closer to the medians than the arithmetic means (illustrated in



Figures 2-3, 2-4 and 2-5). This is evidence that the distributions are more symmetric on a log scale than a linear

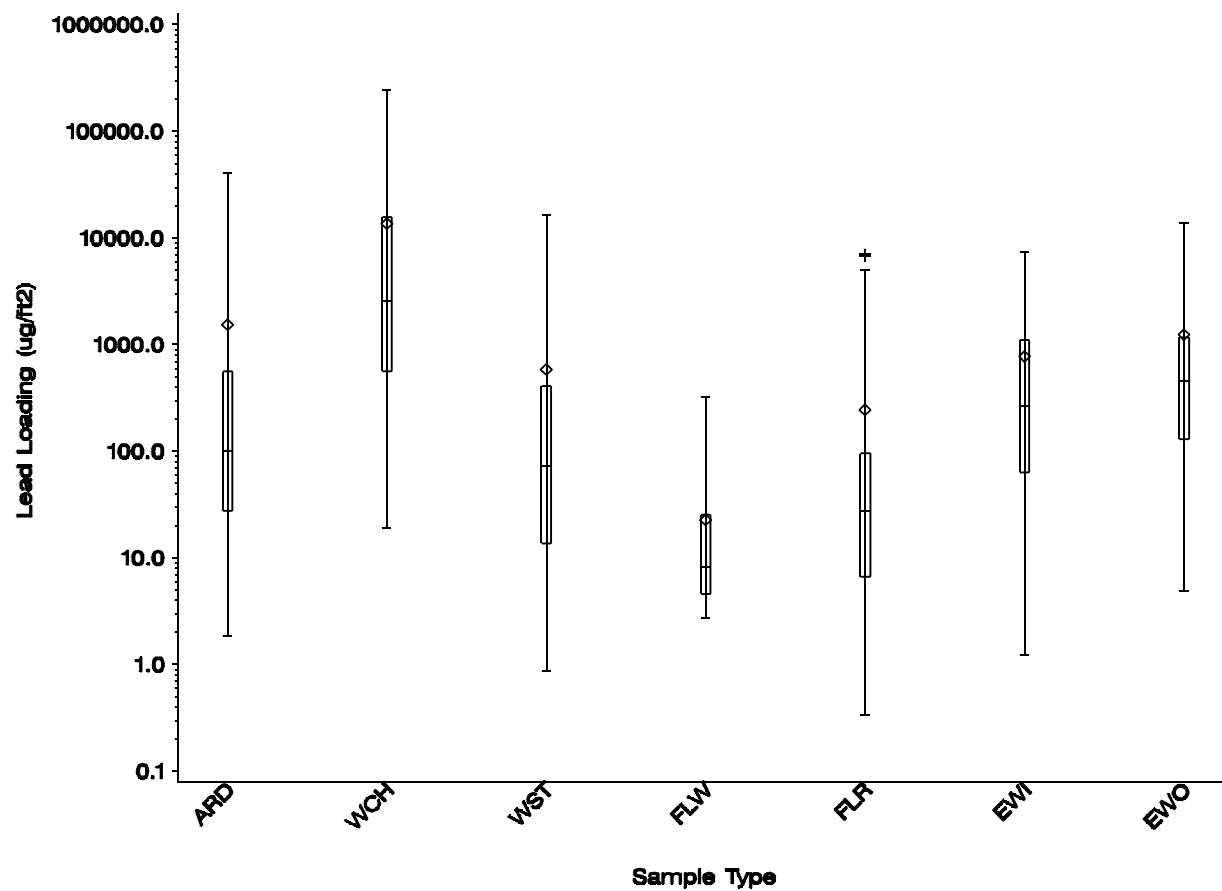


Figure 2-3. Lead loading ( $\mu\text{g}/\text{ft}^2$ ) by sample type.

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Box represents range from 25th to 75th percentile; bar and diamond represent geometric and arithmetic means, respectively; whiskers represent lower and upper tails of the distribution; and extreme data points are classified as either minor (pluses) or extreme (stars).

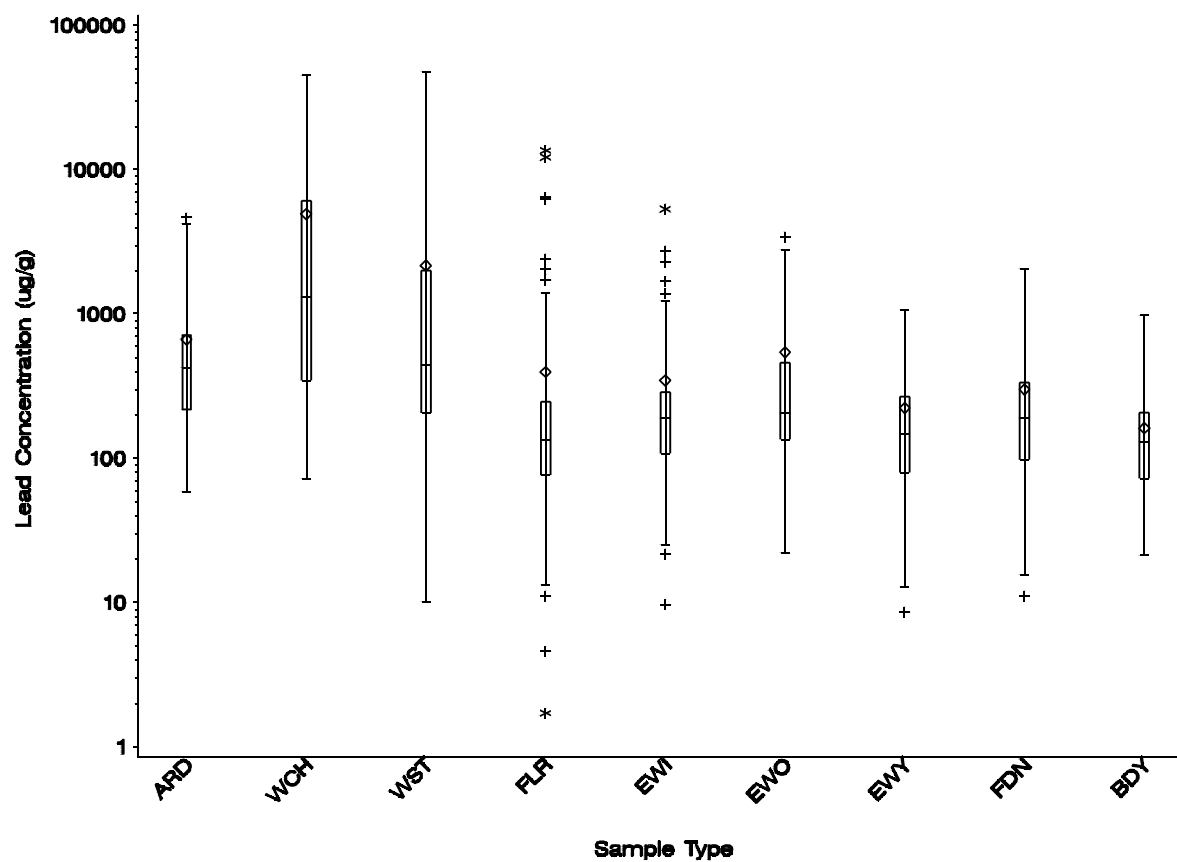


Figure 2-4. Lead concentration (µg/g) by sample type.

Box represents range from 25th to 75th percentile; bar and diamond represent geometric and arithmetic means, respectively; whiskers represent lower and upper tails of the distribution; and extreme data points are classified as either minor (pluses) or extreme (stars).

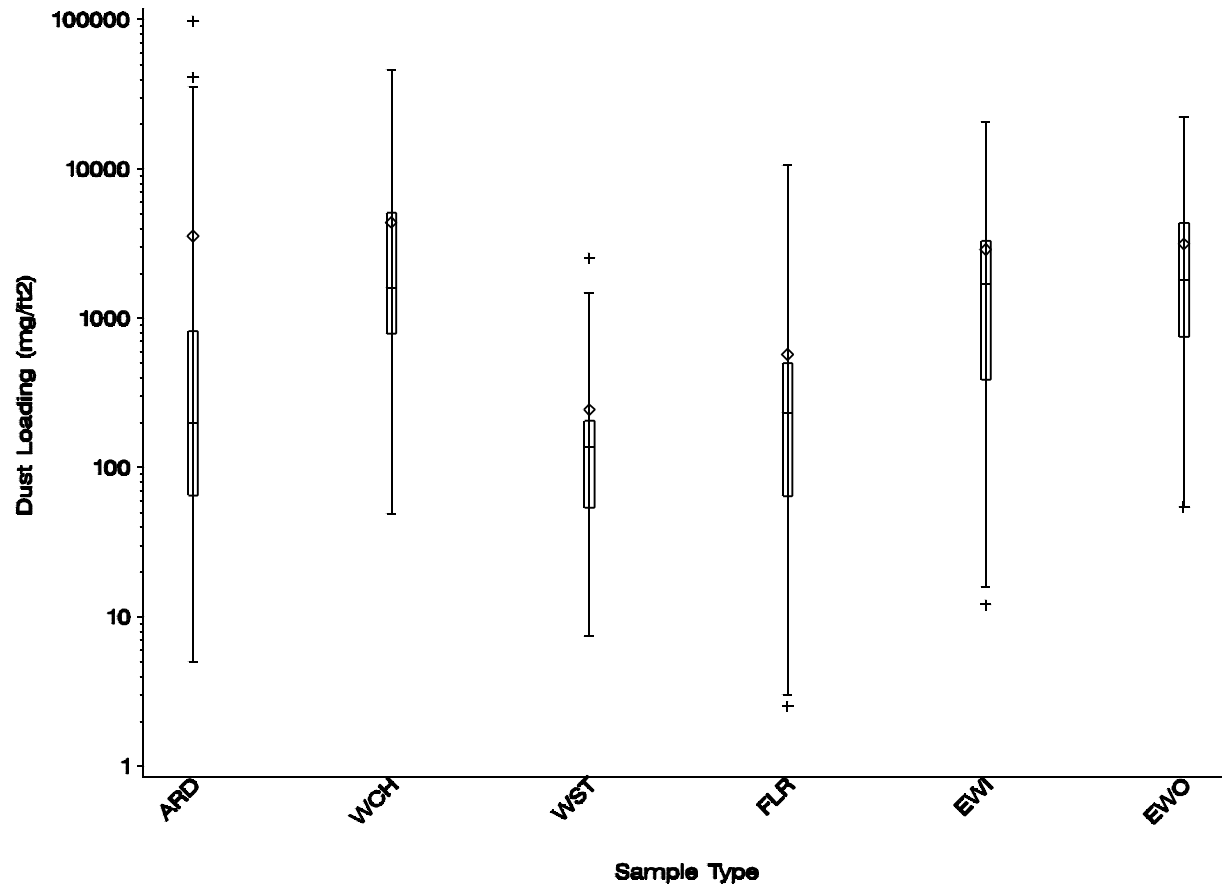


Figure 2-5. Dust loading (mg/ft<sup>2</sup>) by sample type.

Box represents range from 25th to 75th percentile; bar and diamond represent geometric and arithmetic means, respectively; whiskers represent lower and upper tails of the distribution; and extreme data points are classified as either minor (pluses) or extreme (stars).

scale, and hence that the lognormal distribution is more appropriate than the normal distribution.

The geometric mean and logarithmic standard deviation are natural summary parameters for lognormally distributed data. The geometric mean is calculated by taking the natural logarithm of the data values, calculating their arithmetic mean, and exponentiating (taking the antilog). The logarithmic standard deviation, in turn, is determined by taking the natural logarithm of the original data and then calculating their standard deviation.

Correlations among lead loadings, lead concentrations, and dust loadings were assessed for the six types of vacuum dust samples collected. Table 2-2 displays the estimated correlations for each type of sample. These estimates are based on the log-transformed data. For all six sample types the estimated correlations between lead loadings and lead concentrations, and lead loadings and dust loadings were significantly different from zero. This is to be expected since lead loading can be calculated as the product of lead concentration times dust loading, divided by 1000. In contrast, the estimated correlations between lead concentrations and dust loadings were not significantly different from zero for any of the sample types. The estimated correlations between lead loadings and dust loadings were higher than those between lead loadings and lead concentrations, except for window stool and channel samples. When the samples were pooled across sample types, all the average correlations were significantly different from zero. The average estimated correlation among lead concentrations and dust loadings (0.12), however, was smaller than those among lead loadings and dust loadings (0.82), and lead loadings and lead concentrations (0.67).



**Table 2-2. Correlations of Log Lead Loading Versus Log Lead Concentration for Dust Samples**

Sample Type	Number of Samples	Estimated Correlation		
		Pb Load vs Pb Conc	Pb Load vs Dust Load	Pb Conc vs Dust Load
Air Ducts	109	0.50*	0.92*	0.12
Window Channel	98	0.76*	0.66*	0.002
Window Stool	113	0.84*	0.70*	0.19
Floor	238	0.58*	0.83*	0.02
Entryway Interior	100	0.56*	0.86*	0.05
Entryway Exterior	97	0.66*	0.79*	0.07
Across Sample Types	755	0.67*	0.82*	0.12*

\* Significant at the 0.01 level.

#### **2.4 CLASSIFICATION OF HOUSES**

At least two abatement methods were used for almost every house abated in the HUD Abatement Demonstration. In most cases, both encapsulant/enclosure and removal methods were applied. Table 2-3 displays the interior square footage abated by each of the six method categories used in the demonstration: encapsulation, enclosure, removal, heat gun, chemical stripping, and removal and replacement. Encapsulation/enclosure and removal subtotals and grand total abatement square footage abated are also listed. The arithmetic average and median of each column is listed at the bottom of the table. Table 2-4 displays the same information on exterior abatement. It is clear that there is wide variety in the distribution of methods applied. Recognition of this distribution was necessary in order to characterize differences in abatement performance as it depends on the abatement method applied. Details of the approach used are described in Section 3.0 on statistical models.

**Table 2-3. Interior Abatement by Method for Each House (ft<sup>2</sup>)**

House	Encapsulation/Enclosure			Removal					Total Abated
	Encapsulate	Enclosure	Total E/E	Removal	Heat Gun	Chemical Stripping	Remove/ Replace	Total Removal	
07	257.67	200.00	457.67	0.00	0.00	0.00	0.00	0.00	457.67
09	107.91	0.00	107.91	0.00	0.00	0.00	0.00	0.00	107.91
10	681.60	0.00	681.60	0.00	0.00	26.00	0.00	26.00	707.60
11	146.66	0.00	146.66	0.00	0.00	11.10	0.00	11.10	157.76
17	192.00	0.00	192.00	0.00	0.00	0.00	0.00	0.00	192.00
18	12.00	0.00	12.00	0.00	0.00	0.00	0.00	0.00	12.00
21	0.00	120.00	120.00	0.00	175.41	0.00	68.00	243.41	363.41
24	0.00	0.00	0.00	0.00	0.00	1.00	12.68	13.68	13.68
25	157.00	167.00	324.00	0.00	0.00	0.00	0.00	0.00	324.00
31	21.00	0.00	21.00	0.00	0.00	0.00	0.00	0.00	21.00
39	0.00	1037.00	1037.00	0.00	353.40	54.00	79.00	486.40	1523.40
40	132.99	0.00	132.99	0.00	0.00	0.00	0.00	0.00	132.99
41	1204.99	0.00	1204.99	0.00	0.00	0.00	0.00	0.00	1204.99
44	0.00	0.00	0.00	0.00	20.00	25.00	44.44	89.44	89.44
46	0.50	0.00	0.50	0.00	89.95	0.00	0.00	89.95	90.45
50	0.00	0.00	0.00	0.00	0.00	72.94	0.00	72.94	72.94
51	354.00	656.00	1010.00	34.17	0.00	415.93	13.67	463.77	1473.77
55	89.03	0.00	89.03	0.00	0.00	0.00	0.00	0.00	89.03
57	0.00	343.00	343.00	0.00	0.00	0.00	0.00	0.00	343.00
60	0.00	0.00	0.00	0.00	0.00	50.99	0.00	50.99	50.99
61	133.07	397.00	530.07	0.00	0.00	0.00	0.00	0.00	530.07
69	0.00	377.00	377.00	0.00	0.00	0.00	131.64	131.64	508.64
70	962.16	562.00	1524.16	0.00	0.00	0.00	0.00	0.00	1524.16
71	78.66	230.00	308.66	0.00	0.00	148.41	38.05	186.46	495.12
72	521.36	0.00	521.36	0.00	0.00	41.85	0.00	41.85	563.21
74	105.00	0.00	105.00	0.00	0.00	0.00	0.00	0.00	105.00
77	0.00	0.00	0.00	0.00	0.00	21.00	0.00	21.00	21.00
80	287.99	132.00	419.99	0.00	0.00	28.60	0.00	28.60	448.59
81	0.00	0.00	0.00	0.00	63.83	0.00	0.00	63.83	63.83
84	49.98	0.00	49.98	0.00	0.00	0.00	0.00	0.00	49.98
90	50.00	542.00	592.00	136.00	0.00	0.00	96.99	232.99	824.99
93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94	263.98	94.00	357.98	0.00	0.00	20.00	0.00	20.00	377.98
96	4.33	0.00	4.33	0.00	351.98	0.00	2.00	353.98	358.31
99	1060.93	210.00	1270.93	0.00	0.00	0.00	4.33	4.33	1275.26
Average	196.42	144.77	341.19	4.86	30.13	26.19	14.02	75.21	416.40
Median	78.66	0	146.66	0	0	0	0	13.68	324

**Table 2-4. Exterior Abatement by Method for Each House (ft<sup>2</sup>)**

House	Encapsulation/Enclosure			Removal					Total Abated
	Encapsulate	Enclosure	Total E/E	Removal	Heat Gun	Chemical Stripping	Remove/ Replace	Total Removal	
07	103.64	194.00	297.64	0.00	0.00	0.00	67.50	67.50	365.14
09	376.97	0.00	376.97	0.00	0.00	0.00	0.00	0.00	376.97
10	152.31	0.00	152.31	0.00	0.00	0.00	0.00	0.00	152.31
11	141.23	0.00	141.23	0.00	0.00	0.00	0.00	0.00	141.23
17	140.67	0.00	140.67	0.00	0.00	0.00	0.00	0.00	140.67



House	Encapsulation/Enclosure			Removal					Total Abated
	Encapsulate	Enclosure	Total E/E	Removal	Heat Gun	Chemical Stripping	Remove/ Replace	Total Removal	
07	103.64	194.00	297.64	0.00	0.00	0.00	67.50	67.50	365.14
18	107.31	0.00	107.31	0.00	0.00	0.00	0.00	0.00	107.31
21	0.00	0.00	0.00	0.00	194.58	761.00	0.00	955.58	955.58
24	167.00	100.00	267.00	0.00	0.00	0.00	204.80	204.80	471.80
25	210.30	0.00	210.30	0.00	0.00	0.00	0.00	0.00	210.30
31	980.44	0.00	980.44	0.00	0.00	0.00	61.50	61.50	1041.94
39	0.00	1682.00	1682.00	0.00	390.62	0.00	0.00	390.62	2072.62
40	1513.49	0.00	1513.49	0.00	0.00	0.00	0.00	0.00	1513.49
41	542.96	0.00	542.96	0.00	0.00	0.00	17.32	17.32	560.28
44	0.00	420.00	420.00	0.00	0.00	0.00	223.79	223.79	643.79
46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	0.00	256.00	256.00	0.00	0.00	252.50	56.25	308.75	564.75
51	1656.00	0.00	1656.00	0.00	0.00	145.67	0.00	145.67	1801.67
55	781.81	22.00	803.81	0.00	0.00	0.00	0.00	0.00	803.81
57	0.00	0.00	0.00	0.00	24.00	1176.28	0.00	1200.28	1200.28
60	0.00	1367.67	1367.67	0.00	0.00	61.65	17.67	79.32	1446.98
61	185.44	33.49	218.94	0.00	0.00	0.00	0.00	0.00	218.94
69	0.00	209.00	209.00	0.00	146.73	0.00	4.33	151.06	360.06
70	127.30	1366.17	1493.47	0.00	0.00	0.00	0.00	0.00	1493.47
71	0.00	150.00	150.00	0.00	0.00	141.80	12.75	154.55	304.55
72	836.03	0.00	836.03	0.00	0.00	0.00	0.00	0.00	836.03
74	80.56	0.00	80.56	0.00	0.00	0.00	0.00	0.00	80.56
77	187.80	922.00	1109.80	0.00	0.00	0.00	0.00	0.00	1109.80
80	181.00	0.00	181.00	0.00	0.00	0.00	21.00	21.00	202.00
81	0.00	150.00	150.00	0.00	257.79	0.00	15.75	273.54	423.54
84	1300.55	55.00	1355.55	0.00	0.00	0.00	121.50	121.50	1477.05
90	0.00	1839.00	1839.00	161.50	0.00	37.00	42.67	241.17	2080.17
93	308.81	0.00	308.81	0.00	0.00	0.00	0.00	0.00	308.81
94	368.10	229.60	597.70	0.00	0.00	19.37	67.20	86.57	684.27
96	0.00	123.00	123.00	0.00	168.34	0.00	84.00	252.34	375.34
99	759.83	60.00	819.83	5.33	0.00	0.00	101.25	106.58	926.42
Average	320.27	262.26	582.51	4.77	33.77	74.15	31.98	144.67	727.20
Median	141.23	22	297.64	0	0	0	0	61.5	560.28

XRF testing was used to prioritize houses for abatement in the HUD Demonstration. Generally, if paint lead loadings greater than 1.0 mg/cm<sup>2</sup> were measured in a house, then the house was abated. However, there were some houses with lead loadings above this threshold that were not abated. Table 2-5 displays the area of each unabated house with lead loadings at or above the 1.0 mg/cm<sup>2</sup> threshold separately for interior and exterior components. Averages and medians are listed at the bottom of the table. Note that at least 50 percent of the houses had zero square feet of

the components measured with XRF level at or above 1.0 mg/cm<sup>2</sup> (both for interior and exterior).

**Table 2-5. Square Footages of Components with XRF Results at or Above 1.0 mg/cm<sup>2</sup> in Unabated Houses**

House	Area (ft <sup>2</sup> ) with Lead at or Above 1.0 mg/cm <sup>2</sup>	
	Interior Components	Exterior Components
03	0	0
14	100	190
16	2.5	0
19	0	0
22	0	0
27	5	0
28	56	0
33	0	70
45	0	0
49	0	625
53	0	120
65	0	146.7
68	110	0
78	125	40
79	116	0
88	105	34.2
95	0	0
Average	36.4	72.1
Median	0	0

The interior and exterior of each housing unit was classified as either control, predominantly encapsulated/enclosed, or predominantly removal, based on the amount of abatement performed. Some abated houses had an exterior classification different from the interior classification. Table 2-6 lists the number of housing units in each category.

**Table 2-6. Distribution of Unabated, E/E, and Removal Houses; Interior and Exterior Abatement History**

Location	Control	Abated		
		E/E	Removal	Unabated
Interior	17	25	9	1*
Exterior	17	28	6	1**

\* House 93 had no interior abatement performed, but the exterior was abated primarily by E/E methods.

\*\* House 46 had no exterior abatement performed, but the interior was abated primarily by removal methods.

## 2.5 DESCRIPTIVE PLOTS

Figures 2-6 and 2-7 present the geometric mean lead loading, lead concentration, and dust loading results by sample type for unabated houses and abated houses, respectively. These plots can be used to compare the three types of measurements across sample types and house types. With a single exception (exterior entryway dust loading in abated houses), the highest lead loadings, dust loadings, and lead concentrations were obtained from window channel samples. Also, the geometric mean lead concentrations were similar for all three soil sample types, though the lead concentrations in foundation samples from abated houses were highest.

An initial assessment of the abatement procedures can be made by examining Figures 2-8, 2-9, and 2-10. In Figure 2-8, the

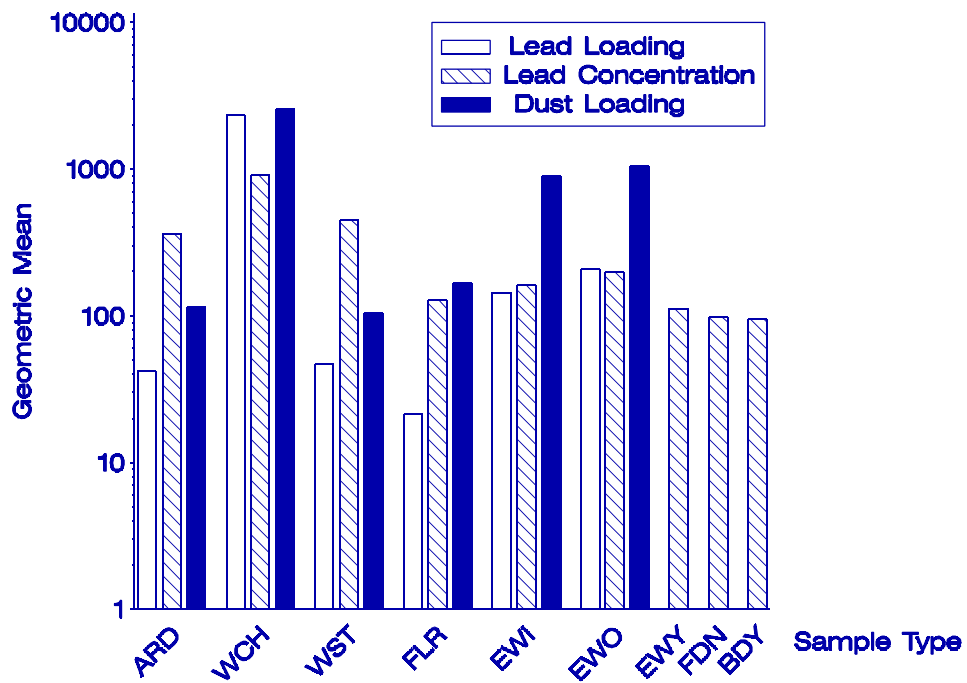


Figure 2-6. Geometric mean lead loading (µg/ft²), lead concentration (µg/g), and dust loading (mg/ft²) by sample type: Unabated units.

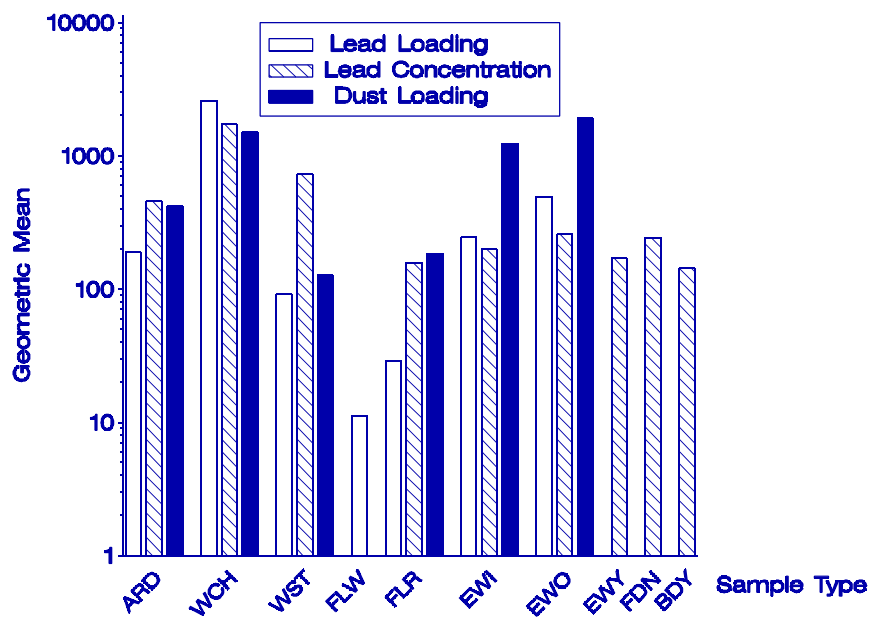


Figure 2-7. Geometric mean lead loading ( $\mu\text{g}/\text{ft}^2$ ), lead concentration ( $\mu\text{g}/\text{g}$ ), and dust loading ( $\text{mg}/\text{ft}^2$ ) by sample type: Abated units.

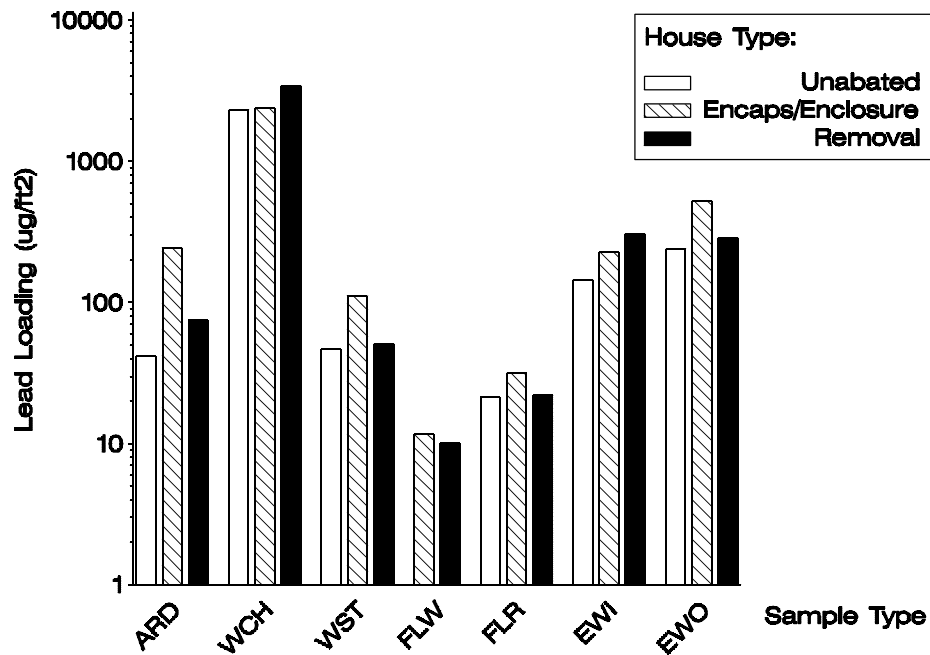


Figure 2-8. Lead loading ( $\mu\text{g}/\text{ft}^2$ ) by sample type and method of abatement.

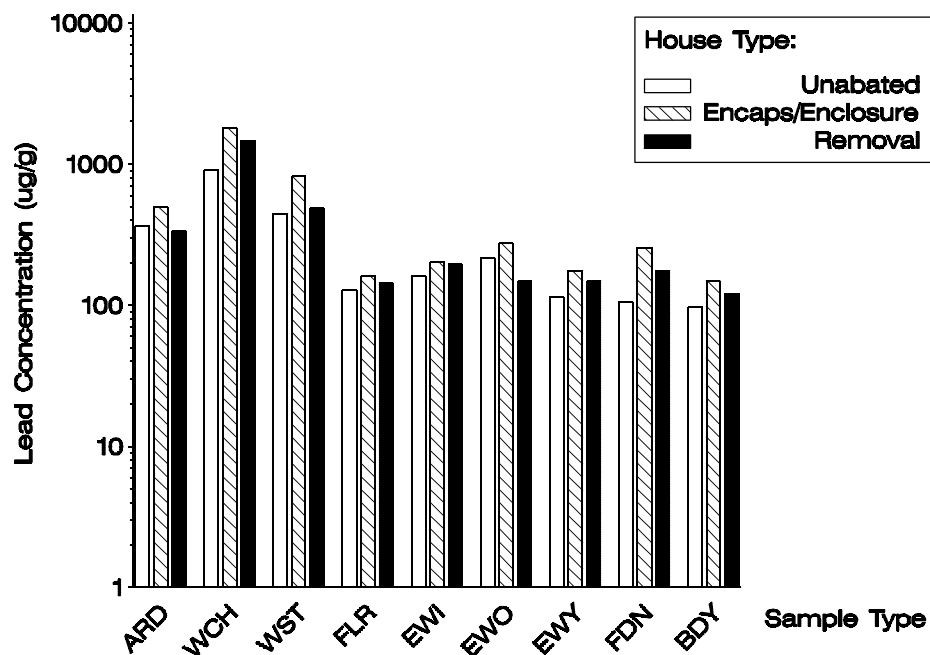
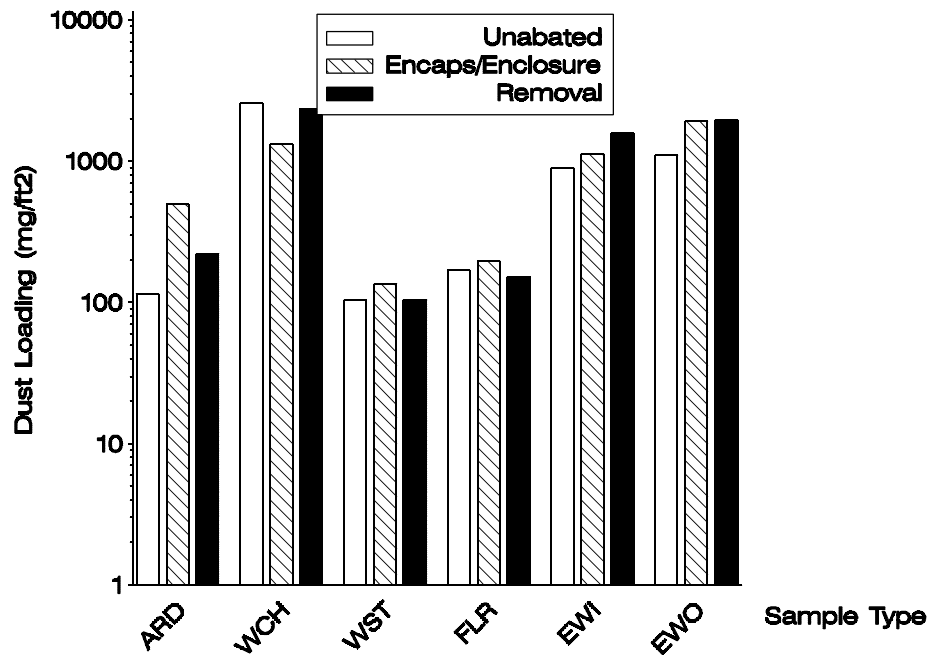


Figure 2-9. Lead concentration ( $\mu\text{g}/\text{g}$ ) by sample type and method of abatement.



**Figure 2-10. Dust loading (mg/ft<sup>2</sup>) by sample type and method of abatement.**

geometric mean lead loading for control, predominantly encapsulated/enclosed, and predominantly removal houses are displayed by sample type. Notice that because the floor samples collected with wipes were only taken from abated houses, there is no unabated bar. (Wipe samples are collected only for a quality control comparison with vacuum samples.) For interior sample types, abated houses were classified according the predominant method of interior abatement. For exterior sample types, abated houses were classified according to the predominant method of exterior abatement. Figures 2-9 and 2-10 present similar bar charts for lead concentration and dust loading, respectively. Section 4 discusses the model estimates of these geometric means after controlling for different levels of abatement and other factors. For all sample types, the predominantly



encapsulated/enclosed houses exhibited the highest geometric mean lead concentrations. The geometric mean lead concentration for predominantly removal units were usually higher than for unabated houses, with the exception of air ducts and entryway exterior samples. This pattern was not duplicated in either the lead loading or dust loading results. The results for unabated houses, however, were usually lowest. A striking exception is evident for window channel samples. The geometric mean lead loading and dust loading for window channels were actually higher for unabated houses than for predominantly encapsulated/enclosed houses.

## **2.6 ESTIMATED LEVEL OF DETECTION AND LEVEL OF QUANTIFICATION**

In order to assess the significance of the lead concentration and lead loading results reported, it is important to understand the sensitivity of the laboratory procedures employed. This assessment may be performed by considering two parameters of sensitivity, the estimated level of detection (ELOD) and the level of quantification (LOQ). Both parameters are stated in terms of the instrument response concentration, which is the amount of lead ( $\mu\text{g}$ ) per dilution volume (mL) in instrument samples. The ELOD is a practical upper bound on the estimated concentration ( $\mu\text{g/mL}$ ) that would result from the analysis of samples which contain no lead. The LOQ, in turn, is the smallest concentration which will consistently produce estimated concentrations that are within 30% of the true concentration.

Table 2-7 contains the ELODs for the 24 instrument batches of regular field samples. Three percent (35 out of 1169) of the regular samples had concentrations below the ELOD for their instrument batch. These samples are detailed in Table A-3 of the Appendix.

The LOQ was determined from information outlined in the memorandum, "Potential Instrumental Measurement Error for Lead Analysis," dated September 21, 1992. This memo, portions of

which are excerpted in Table 2-8, documented the instrumental measurement error for a series of known lead concentrations ranging from 0.02 to 0.50  $\mu\text{g/mL}$ . The results suggested an LOQ of 0.208  $\mu\text{g/mL}$ .

Approximately 19% (226 out of 1169) of the regular field samples had concentrations below the LOQ. To examine the potential impact of these samples on the statistical analysis, two sets of statistical analyses were performed. In the first set of analyses, the concentrations below the ELOD were set equal to the ELOD. No modifications were made to concentrations above the ELOD but below the LOQ. In the second set of analyses, all concentrations below the LOQ were set equal to the LOQ. The mixed model described in Section 4 was fitted separately to each set of data. Since the second set of analyses agreed with the first, only the results of the first set of analyses were presented in this report. The only notable disagreement between the two sets of analyses was that the difference in lead concentrations in air ducts between abated and control homes was not as great by the second analysis.

**Table 2-7. Estimated Level of Detection by Instrument Batch**

Instrument Batch	ELOD µg/mL	Instrument Batch	ELOD µg/mL
E04272A	0.0298	E06122A	0.0370
E04292A	0.0138	E06152A	0.0254
E05042A	0.0383	E06242A	0.0263
E05072B	0.0324	E06262A	0.0655
E05122B	0.0308	E06292A	0.0527
E05132A	0.0255	E07142A	0.0300
E05192A	0.0293	E07212A	0.0593
E05262A	0.0461	E07242A	0.0354
E05272A	0.0634	E07302A	0.0514
E06022A	0.0400	E08032A	0.0272
E06042A	0.0465	E08062A	0.0349
E06112A	0.0553	E08242A	0.0240

**Table 2-8. Potential Instrumental Measurement Error:  
Calculated Results**

Lead Concentration (µg/mL)	Average Response (µg/mL)	n-1 Standard Deviation	% Relative Standard Deviation
0.02	0.03303	0.01682	50.91%
0.03	0.04253	0.01893	44.50%
0.05	0.06625	0.02012	30.36%
0.07	0.08816	0.01891	21.45%
0.10	0.11709	0.02000	17.08%
0.30	0.31963	0.02643	8.27%
0.50	0.52871	0.02155	4.08%

